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SYNOPSIS OF THE NORTH AMERICAN SPECIES OF ASTERINA, DIMEROSPORIUM AND MELIOLA.

BY GEORGE MARTIN.

ASTERINA.

ASTERINA, Liv. Ann. Science Nat. 1845, 3, p. 59. (Etym. *Aster* from the radiating mycelium.) Perithecia globose, depressed or lenticular, membranous, subastomous, seated upon spots of black radiating subsuperficial (rarely subinnate) mycelium. Asci properly short and thick, mostly 8-spored; sporidia two-celled, pleuriseptate or continuous, hyaline or brown. Sylloge Fungorum I, p. 39.

The perithecia in the species we now find included in this genus vary from an entire membranous sac to a mere covering of coalesced, radiating hyphæ, and the mycelium, which typically forms black spots, is often light colored, scant, evanescent or entirely obsolete. The genus therefore contains some species nearly approaching Sphærella and Microthyrium on the one hand and Ascomycetella on the other.

The following classification has been adopted:

A. Perithecia complete, depressed or lenticular.
B. Perithecia incomplete, flattened or scutellate.
C. Species imperfect or doubtful.

Species with globose perithecia will be included in Dimerosporium.

The quotation marks indicate that the species so enclosed are only known to me through the published descriptions.

It is proper that I should here state that I am under great obligation to my friend, J. B. Ellis, for furnishing me with specimens not in my herbarium, and for his criticism of many of my notes.

A. Perithecia complete, depressed or lenticular.

1. ASTERNIA ANOMOLA, Cke. & Hark., Grev. 9, p. 67.

"Effused black, velvety; perithecia hemispherical or globose depressed; mycelium intricate, brown with erect, rigid, scattered setæ; asci clavate; sporidia biseriate, lanceolate, 1—5-septate, hyaline, 20—24 x 4 *u*. Perithecia 80 *u* in diameter, setæ about twice as long and sometimes found upon the former." Probably a Dimerosporium.

On living laurel leaves, California.

2. ASTERINA CARNEA, Ellis & Martin. Am. Nat. 17, p. 1284, Ellis N. A. F. No. 1290.

Mycelium thin, brown, hypophyllous, adnate, mostly near the margin of the leaf or in orbicular spots, about 5 mm. in diameter; perithecia flesh colored, flattened, soft, crowded, 60—100 *u* in diameter; asci obovate, sessile, 8-spored, 30—40 x 22—35 *u*; sporidia subhyaline, ovate, two-celled, uniseptate, 16—17 x 7—8 *u*.

On *Persea palustris*, Florida.

3. ASTERINA CELASTRI, Ellis & Kellerman. Journ. of Mycology I, p. 3.

Perithecia hypophyllous in groups or scattered, convex, orbicular, black, 250 *u* in diameter; mycelium of brown radiating threads around the base; asci oblong, ovate, 12—15 x 6—7 *u*, filled with granular matter; immature. The parts of the leaf occupied by the groups of perithecia are a little darker than the surrounding portions.

On living leaves of *Celastrus scandens*, Kansas.

4. ASTERINA DELITESCENS, E. & M. Am. Nat. 17, p. 1284. Ellis N. A. F. No. 1291.

Mycelium thin, black, orbicular, epiphyllous, 2—4 mm. in diameter, perithecia black, flattened, crowded, 75 x 100 *u*, structure radiate-cellular; asci oboval or subglobose, 8-spored, 30—35 x 18—24 *u*; sporidia subhyaline, oval, uniseptate, 15—18 x 6—7 *u*.

On living leaves of *Persea palustris*, Florida.

5. ASTERINA GAULTHERIÆ, Curtis. Ellis N. A. F. No. 1358.

Perithecia brown-black, flattened, slightly elevated in the center, hypophyllous, scattered, 170—250 *u* in diameter, surrounded by a narrow border of brown, branching mycelium; asci ovate, 22—25 x 13—16 *u*; sporidia hyaline, obovate, uniseptate, the upper cell the larger, 9 x 3 *u*.

On living leaves of *Gaultheria procumbens*, Newton, Mass.

6. ASTERINA NUDA, Pk.

Mycelium brown, branching, scanty; perithecia black, at first subglobose, afterwards depressed, thickly clustered near the midrib, mostly hypophyllous, 100—150 *u* in diameter, structure cellular; asci oval, 8-spored, 35—40 x 10 *u*; sporidia ovate, hyaline, uniseptate, biseriate, 10—12 x 3—4 *u*.

On living leaves of *Abies* (?)

I do not know where Prof. Peck published this species, but the above description is from an authentic specimen gathered by him.

7. Asterina Pearsoni, E. & E. Jour. of Mycology, I, p. 92.

"Perithecia minute (100 *u*), flat, superficial, obscurely perforated above, of close cellular structure, with a scanty, subradiating mycelium around the margin; asci oblong, obtuse, sessile, 40 x 15 *u*, without paraphyses; sporidia biseriate, clavate, oblong, granular, becoming uniseptate and slightly constricted at the septa, 15—20 x 3½—4½ *u*, acute below, obtuse above, hyaline."

On blackberry canes, Vineland, N. J.

8. Asterina Pinastri, Sacc. & Ellis. Michelia 2, p. 567. Ellis N. A. F. No. 789.

Perithecia black, globose-depressed, gregarious, astomous, 100—120 *u*. Structure cellular; mycelium brown, branching, closely septate, very scant; asci oblong, ends obtuse, sessile, 8-spored, 40—50 x 20—24 *u*, without paraphyses; sporidia 2—3 seriate, oval, uniseptate, hyaline at first, then dusky, 18—20 x 6—7 *u*.

On leaves of *Pinus rigida*, New Jersey.

9. Asterina tenella. Cke. Grev. 13, p. 67.

"Epiphyllous, effused, thin, black; perithecia minute (.03—.22 mm.) applanate, mingled with brown, creeping, mycelium; asci saccate, 4—8-spored; sporidia (eight-spored) 28—30 x 12—14 *u*, (four-spcred) 40 x 22 *u*, light brown."

On *Persea Caroliniensis*, Carolina.

10. Asterina Xerophylli, Ellis. Am. Nat. 17, p. 319.

"Mycelium scanty; perithecia entirely superficial, orbicular or subelongated, slightly depressed, 167 *u* in diameter; asci obovate contracted into a thick, stipe-like base, 35 x 15 *u*; sporidia hyaline, fusiform or clavate-fusiform, faintly 3-septate, 18—20 x 3—3½ *u*.

On fading leaves of *Xerophyllum asphodeloides*, New Jersey.

B. Perithecia incomplete, flattened or scutellate.

11. Asterina discoidea, E. & M. Am. Nat 18, p. 1148. Jour. of Mycology, 1, p. 101.

Perithecia hypophyllous, orbicular, slightly depressed in the center, olivaceous, thin, 500—800 *u* in diameter with an indistinct, reticulated margin; asci obovate or globose, 30—40 x 30—35 *u*; sporidia crowded, clavate-oblong, uniseptate, 12—16 x 4—5 *u*. Closely allied to Ascomycetella.

On living leaves of *Quercus laurifolia*, and of *Olea Americana*, Florida.

12. Asterina Ilicis, Ellis. Am. Nat. 17, p. 319. Ellis N. A. F. No. 1357.

Perithecia brown black, hypophyllous, scattered, adnate, at first hemispherical then flattened and depressed, 100—120 *u* in diameter, opening circular, structure a disc of brown, interlacing hyphæ covering the nucleus and forming a narrow margin beyond; asci obovate, 8-spored, 22—30 x 9–15 *u* sporidia subhyaline, oblong, 1-septate, biseriate, 11 x 4 *u*.

On living leaves of *Ilex glabra*, Newfield, N. J.

13. ASTERINA INTRICATA, E. & M. n. sp.

Mycelium white, scanty, evanescent; perithecia brown, flat-orbicular, soft, very thin, hypophyllous, 500 *u* in diameter, asci subglobose, stipitate, 15—18 x 18 *u*; sporidia hyaline, obovate or ovate, 1-septate, 7–12 x 2—3 *u*. Closely allied to Ascomycetella.

On living leaves of *Quercus arenaria*, Florida.

14. ASTERINA LEPIDIGENA, E. & M. Am. Nat. 18, p. 1148. Ellis N. A. F. No. 1361.

Mycelium hyaline, scanty, hypophyllous; perithecia black, subglobose, at length flat, very thin and fragile, 200—300 *u* in diameter; asci ovate, 8-spored, 30 x 15 or 42 x 12 *u*; sporidia obovate, hyaline, 1-septate, 12 x 4 *u*.

Attached to the epidermal scales on old, living leaves of *Andromeda ferruginea*, Florida. Closely allied to Ascomycetella.

15. ASTERINA PATELLOIDES, E. & M. *A. erysiphoides*, E. & M. Ellis N. A. F. No. 1359.

Perithecia dark brown, soft, orbicular, flattened, depressed in the center, hypophyllous, 275—300 *u*, with a narrow border of scanty, radiating, white, mycelium; asci ovate, oblong, 8-spored, 36 x 15 *u*; sporidia obovate, 1-septate, 2-seriate, hyaline, 15—6 *u*. Closely allied to Ascomycetella.

On living leaves of *Quercus laurifolia*, Florida.

The name of this species has been changed, as A. erysiphoides had previously been given to another plant.

16. ASTERINA PUSTULATA, E. & M. Am. Nat. 18, p. 1148.

Perithecia brown, soft, flattened, hypophyllous, adnate, 200–500 *u* in diameter, structure a membranous disc of brown, branching, coalesced hyphæ, covering the nucleus and forming a narrow border beyond; asci subglobose, 8-spored, 50—60 *u* in diameter, sporidia hyaline, obovate, 1-septate, 30—40 x 10—12 *u*. Closely allied to Ascomycetella.

On living leaves of *Quercus laurifolia*, Florida.

17. ASTERINA STOMATOPHORA, E. & M. Jour. of Mycology, I, p. 98.

Perithecia brown black, lenticular, stomatous, hypophyllous, scattered, 170—180 *u* in diameter, texture cellular, forming a disc which covers the nucleus and extends beyond in a thin reticulated margin; asci oblong, broader above and abruptly contracted into a short stipe, 30—35 x 6—8 *u*; paraphyses none; sporidia oblong-obovate, hyaline, 1-septate, 2-seriate, 7—12 x 2½—3.

On living leaves of *Quercus laurifolia*, and of *Gelsemium sempervirens*, Florida.

18. ASTERINA SUBCYANEA, E. & M. Am. Nat. 18, p. 1148. Ellis N. A. F. No. 1360.

Perithecia hypophyllous, convex, depressed, ostiolate, obsolete beneath, 250—300 *u* in diameter, structure moniliform hyphæ of subglobose, dark greenish blue cells, 5—7 *u* in diameter, which cover the nucleus and extend beyond in a thin, membranous border, closely adnate to the leaf, ostiolum papilliform, collapsing with a broad, circular opening when dry; asci slightly narrower at each end, sessile, 8-spored, 75 x 15 *u*; sporidia hyaline, oblong-clavate, 1-septate, 2-seriate, 20 x 4—7 *u*.

On living leaves of *Quercus laurifolia*, Florida.

C. Species imperfect or doubtful.

19. ASTERINA CONGLOBATA, B. & C. Grev. 4, p. 9.

"Mycelium a few slender threads; perithecia globose, minute, conglobate; asci obovate; sporidia shortly subfusiform, 1-septate." Probably a Dimerosporium.

On *Arbutus Uva-ursi.*

20. ASTERINA COMATA, B. & Rav. Grev. 4, p. 9. Ravenel F. A. No. 73.

Scattered, large, densely clothed with short, brown hairs, about 700 *u* in diameter; mycelium obsolete. No fruit, immature.

On leaves of *Magnolia glauca* and *M. grandiflora*, Alabama to Florida.

21. ASTERINA CUTICULOSA, Cke. Grev. 7, p. 49. Ravenel F. A. No. 328.

Perithecia brown, orbicular, applanate, adnate, hypophyllous, clustered near the margin of the leaf, 500—800 *u* in diameter, structure cellular membranaceous, obsolete beneath; no mycelium; "asci globose, 25 *u* in diameter; sporidia elliptic, ends obtuse, 1-septate, subconstricted, hyaline, 10 x 5 *u*. A somewhat abnormal species," (Cke.)

On leaves of *Ilex opaca*, Georgia.

My specimen is sterile.

22. ASTERINA DECOLORANS, B. & C. Grev. 4, p. 9.

"Spots orbicular, red, undulate, bullate; mycelium scanty, consisting of a few moniliform threads and others entire; perithecia punctiform; asci short, oblong; sporidia, 1-septate, 10 *u* long."

On an unknown leaf, New Jersey.

23. ASTERINA DIPLODIOIDES, B. & C. Grev. 4, p. 9.

"Spots orbicular, mycelium interrupted; perithecia minute; sporidia oblong, obtuse, uniseptate, light brown, 8 *u* long."

On leaves of *Andromeda acuminata*, Alabama.

24. ASTERINA NIGERRIMA, Ellis. Bulletin Torr. Bot. Club, 8, p. 91.

Mycelium brown, branching, scanty; conidia oval, dusky, 4½–6 x 3 *u*, in subglobose sacs, 60 *u* in diameter. Perithecia black, orbicular, flattened, stomatous, subinnate, 95—140 *u* in diameter, structure cellular-radiate, obsolete beneath, asci oblong-clavate, sessile, 33—36 x 10—14 *u*; sporidia hyaline, obovate, 1-septate, ("4-nucleate," Ellis) 10—12 x 3—4 *u*.

On old stems of *Erigeron*, Newfield, N. J.

This is probably a Microthyrium.

25. ASTERINA OLEINA, Cke. Grev. 11, p. 38. Ravenel F. A. No. 757.

Perethecia hypophyllous, scattered, flattened, discoid with a narrow margin of brown radiating hyphæ; asci clavate, 24—30 x 9—10 *u*; sporidia undeveloped in my specimen. "Sporidia hyaline, small, uniseptate (immature). Pycnidia similar but smaller, stylospores minute, oval, hyaline 5 *u* long." Cke.

On leaves of *Olea Americana.*

26. ASTERINA PELLICULOSA, Berk. Sylloge 1, p. 46.

"Mycelium pelliculose, in spots, black; perithecia globose-depressed, black; asci obovate; sporidia oblong-ellipsoid; 1-septate 16—20 *u* long. Probably a Dimerosporium.

On leaves of *Prinos*, etc., etc. Ceylon, Cuba, N. America, etc."

Asterina pelliculosa in Ravenel's F. A. No. 75, appears to be identical with Dimerosporium (Asterina) orbiculare B. & C., and cannot be the same as that described above.

27. ASTERINA PLANTAGINIS, Ellis. Bull. Torr. Bot. Club, 9, p. 74. Ellis N. A. F. No. 790.

Spots brownish, immarginate; perithecia brown-black, subglobose, membranaceous, innate, clustered in the spots, mostly epiphyllous, 70—80 *u* in diameter, "with a few brown threads radiating from the base or entirely wanting,"(Ellis.) Asci ovate, 26—33 x 13–16 *u*; sporidia hyaline oblong, obtuse, 1-septate, slightly constricted at the middle or 2-nucleate, 9—10 x 3—5 *u*.

On living leaves of *Plantago major*, Philadelphia, Pa.

This is probably a Sphærella.

28. ASTERINA RAMULARIS, Ellis. Bull. Torr. Bot. Club, 9, p. 20. Ellis N. A. F. No. 720.

Mycelium light, subhyaline, very scanty; perithecia flattened, orbicular, stomatous, clustered, frequently coalescing, subinnate, 250—300 *u* in diameter, structure dark brown moniliform hyphæ, covering the nucleus, obsolete beneath, mostly sterile; "Asci oblong, spore bearing portion 50 x 25 *u*, stipe at length absorbed; sporidia light, crowded, elliptical, coarsely granular with 1–2 large vacuoles at first, about 15 x 10 *u*" (Ellis.)

On dead twigs of *Lindera Benzoin.*

Probably a Microthyrium.

29. ASTERINA SPUREA, B. & C. Grev. 4, p. 10.

"Perithecia scattered, dot-like, surrounded by short, articulated, submoniliform, radiating threads, which are joined together laterally in twos, sometimes forked at the apex."

On leaves and stems of *Hyptis radiata.* Carolina and Alabama.

30. ASTERINA WRIGHTII, B. & C. Grev. 4, p. 10.

"Mycelium very thin; perithecia brown, granular, crowded, like little grains of gunpowder, surrounded by cirrhate threads; asci clavate, short." Texas, C. Wright.

"Apparently on some smooth Curcurbit."

31. ASTERINA CUPRESSINA (Rehm) Cke. Grev. 6, p. 17. Ellis N. A. F. No. 500.

Perithecia dark brown, hemispherical or lenticular, adnate, stomatous, 85—290 *u* in diameter; structure coalesced, brown, radiating hyphæ, covering the nucleus and forming a narrow border beyond, obsolete beneath; asci cylindrico clavate, stipitate, 8-spored, 50 x 15 *u*; sporidia brown, obovate, 1-septate, 2-seriate, 12—15 x 6—7 *u*. "Three to six rigid hairs are sometimes attached to the perithecia," and the larger ones contain pycnidia with brown, elliptic stylospores, 20 x 10 *u*," Cke.

On dead leaves of *Cupressus thyoides*. Rhem Ascomycetum, Venturia Cupressina, No. 394.

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